

- Q.1. A glass rod is rubbed with silk, it acquires a positive charge because:-
 (A) Electrons are added to it
 (B) Electrons are removed from it
 (C) Protons are added to it
 (D) Protons are removed from it
- Q.2. Can a metal sphere of radius 1 hold a charge of one Coulomb?
 (A) No
 (B) May or may not
 (C) Yes
 (D) None of the above
- Q.3. The electric field inside a spherical shell of uniform surface charge density is:-
 (A) Zero
 (B) Proportional to the square of radius of shell
 (C) Less than zero
 (D) Proportional to the distance from the centre
- Q.4. The distance between two successive nodes is:-
 (A) 2λ
 (B) $\lambda/2$
 (A) λ
 (A) $\lambda/4$
- Q.5. Sound waves in air do not show the property of:-
 (A) Reflection
 (B) Polarisation
 (C) Refraction
 (D) Diffraction
- Q.6. A 4000 kg. rocket is set for a vertical firing. If the exhaust speed is 400 m/sec how much gas must be ejected per second to supply the thrust needed to overcome the weight of the rocket?
 (A) 90 kg/sec
 (B) 9.8 kg/sec
 (C) 98 kg/sec
 (D) 0.9 8kg/sec
- Q.7. A boy is swinging on a swing in sitting position. When the same boy stands up, the period of swing:-
 (A) Will be shorter
 (B) Will remain same
 (C) Will be longer
- (D) Will depend upon the height of the boy
- Q.8. In an adiabatic change of gas:-
 (A) $PV^\gamma = \text{constant}$
 (B) $PV = RT$
 (C) Temperature remains constant and $PV = \text{constant}$
 (D) $TV^{1-\gamma} = \text{constant}$
- Q.9. Between two rail joints, gaps are left to accommodate:-
 (A) Superficial expansion
 (B) Volume expansion of rail
 (C) To meet the increased pressure when the train passes on it
 (D) Linear expansion
- Q.10. A long string is stretched by 2cm and the potential energy is U, if the string is stretched by 10cm, its potential energy will be:-
 (A) 5U
 (B) 25U
 (C) U/5
 (D) U/25
- Q.11. An electron of mass m and charge e is accelerated from rest through a potential difference V in vacuum. Its final speed will be:-
 (A) eV/m
 (B) $eV/2m$
 (C) $(2eV/m)^{1/2}$
 (D) $(eV/m)^{1/2}$
- Q.12. The electric potential energy of an isolated metal sphere of radius 4cm with total $40\mu\text{C}$ charge will be:-
 (A) 180 KJ
 (B) 180 J
 (C) 1.8 KJ
 (D) 18 J
- Q.13. One Coulomb charge which when placed 1m apart from a similar charge experiences a force of repulsion of:-
 (A) $3 \times 10^9 \text{ N}$
 (B) $9 \times 10^9 \text{ N}$
 (C) $3 \times 10^9 \text{ N}$
 (D) $9 \times 10^9 \text{ N}$

- Q.14. The force between two protons separated by a distance r varies as:-
 (A) r^2
 (B) $[1/(r)^2]$
 (C) r
 (D) $1/r$
- Q.15. The velocity of sound wave in vacuum is:-
 (A) Zero
 (B) 330m/sec
 (C) 256m/sec
 (D) 1000m/sec
- Q.16. The rate of chemical reaction:
 (A) Decreases as the reaction proceeds
 (B) increases as the reaction proceeds
 (C) May increase or decrease during the reaction
 (D) remains constant.
- Q.17. After three half-lives the percentage of fraction of amount left is:
 (A) 6.25
 (B) 12.5
 (C) 50
 (D) 75
- Q.18. The unit of rate constant for zero order reaction is:
 (A) litre s^{-1}
 (B) litre mole $^{-1}$ s^{-1}
 (C) Mole litre $^{-1}$ s^{-1}
 (D) Mole s^{-1}
- Q.19. The conjugate acid of Hydroxide ion is:
 (A) Water
 (B) Hydrochloric acid
 (C) Acetic acid
 (D) Phenol
- Q.20. An aqueous solution whose pH is zero will be
 (A) Alkaline
 (B) Acidic
 (C) Neutral
 (D) Amphoteric
- Q.21. The pH of 10^{-6} M HCl solution is:
 (A) 1.0
 (B) 3.0
- (C) 8.0
 (D) 6.0
- Q.22. Which gas is present under pressure in cold drinks:
 (A) oxygen
 (B) carbon dioxide
 (C) nitrogen
 (D) nitrous oxide
- Q.23. The acid used in lead storage battery is:
 (A) Phosphoric acid
 (B) hydrochloric acid
 (C) Nitric acid
 (D) sulphuric acid
- Q.24. An ingredient of baking powder is:-
 (A) Sodium carbonate
 (B) Borax
 (C) Sodium bicarbonate
 (D) Sodium chloride
- Q.25. Galvanized iron is formed by coating iron with:
 (A) Copper
 (B) Nickel
 (C) Chromium
 (D) Lead
- Q.26. Which is the purest form of Iron:
 (A) steel
 (B) cast iron
 (C) Pig iron
 (D) Wrought iron.
- Q.27. Bauxite is an alloy of which metal
 (A) Iron
 (B) Tin
 (C) Silver
 (D) Aluminium
- Q.28. Ultra violet rays striking the earth is due to depletion of
 (A) Oxygen
 (B) Ozone
 (C) Carbon Dioxide
 (D) Carbon monoxide
- Q.29. Most simplified version of displayed formula is called
 (A) molecular formula
 (B) empirical formula
 (C) structural formula
 (D) skeletal formula

- Q.30. Relative formula C₃H₆ is of molecule
 (A) propene
 (B) ethene
 (C) propane
 (D) ethane
- Q.31. L.P.G. is a hydrocarbon consisting of a mixture of :
 (A) Methane and Butane
 (B) Propane and Butane
 (C) Ethane and Propane
 (D) Ethane and Butane
- Q.32. Alkali metals lose electrons of:-
 (A) s-orbitals
 (B) p-orbitals
 (C) d-orbitals
 (D) f-orbitals
- Q.33. Methyl Orange gives Red colour in:
 (A) Na₂CO₃ solution
 (B) NaCl solution
 (C) HCl solution
 (D) KOH solution
- Q.34. The solution having highest boiling point is:
 (A) 0.1 N Na₂SO₄
 (B) 0.01 MgSO₄
 (C) .01 Al₂(SO₄)₃
 (D) 0.1 N BaSO₄
- Q.35. Internal energy of an Ideal gas depends on:
 (A) Pressure
 (B) Volume
 (C) Temperature
 (D) None of the above
- Q.36. Which of the following compounds are commonly used in tooth-pastes:
 (A) NaCl & NaF
 (B) Hydrogen peroxide
 (C) CaCl₂ & CaF
 (D) CaOCl₂
- Q.37. The number of possible isomers of mono nitrophenol are:-
 (A) Four
 (B) Three
 (C) None
 (D) Two
- Q.38. Metaphosphoric acid has the formula:-
 (A) H₃PO₂
 (B) HPO₃
 (C) H₃PO₄
 (D) H₃PO₃
- Q.39. Which of the following gases is most toxic:
 (A) Cl₂
 (B) SO₂
 (C) CO
 (D) CO₂
- Q.40. Uneven breaking of bond is
 (A) homolytic fission
 (B) heterolytic fission
 (C) binary fission
 (D) multiple fissionwer
- Q.41. Empirical formula for propene is
 (A) CH₂
 (B) C₂H₄
 (C) C₆H₁₂
 (D) C₃H₆
- Q.42. The general formula for aldehydic group is
 (A) CHO
 (B) COOH
 (C) OH
 (D) Cl
- Q.43. Which of the following is not a buffer solution?
 (A) CH₃COOH + CH₃COONa
 (B) Borax + Boric acid
 (C) NH₄OH + NH₄Cl
 (D) CH₃COONH₄
- Q.44. Which of the following is not a green house gas:
 (A) H₂
 (B) CO₂
 (C) CCl₂F₂
 (D) Chloroform
- Q.45. Which gas is used as fire extinguishers?
 (A) Cl₂
 (B) SO₂
 (C) CO
 (D) CO₂

Q.46. **Direction :** Choose the right option from the question given below:

Which of these is a wrong expression?

- (A) a bunch of grapes
- (B) a bunch of kids
- (C) a bunch of keys
- (D) a bunch of roses

Q.47. **Direction :** Choose the right option from the question given below:

We say as blind as a _____.

- (A) fox
- (B) parrot
- (C) whale
- (D) bat

Q.48. **Direction :** Choose the right option from the question given below:
Which of these is not the correct form of superlative degree?

- (A) wisest
- (B) baddest
- (C) cleverest
- (D) best

Q.49. **Direction :** Choose the right option from the question given below:
Pick a word where letter 'w' is silent.

- (A) wrong
- (B) work
- (C) want
- (D) wall

Q.50. **Direction :** Choose the right option from the question given below:
We would never have been successful if you _____ us.

- (A) wouldn't been helping
- (B) had not helped
- (C) haven't been helping
- (D) had helped

Q.51. **Direction :** Choose the right option from the question given below:

Which of these is not a feminine gender?

- (A) Waitress
- (B) Widower
- (C) Authoress
- (D) Nun

Q.52. **Direction :** Choose the right option from the question given below:
The phrase 'blow hot and cold' stands for:-

- (A) to give in writing
- (B) to have firm determination
- (C) to support and oppose at the same time
- (D) to beat the younger

Q.53. **Direction :** Choose the right option from the question given below:

Which of these is not a young bird?

- (A) foal
- (B) chick
- (C) duckling
- (D) owlet

Q.54. **Direction :** Choose the right option from the question given below:

A person swims but a log of wood _____.

- (A) splashes
- (B) flows
- (C) goes
- (D) floats

Q.55. **Direction :** Choose the right option from the question given below:
She took stale bread and gave a _____ one to the children.

- (A) good
- (B) sweet
- (C) new
- (D) fresh

Q.56. The coefficient of x^k ($0 \leq k \leq n$) in the expansion of $E = 1 + (1 + x) + (1 + x)^2 + \dots + (1 + x)^n$ is:-

- (A) ${}^{(n+1)}C_{n+k}$
- (B) ${}^{(n+1)}C_{(k+1)}$
- (C) nC_k
- (D) ${}^nC_{n-k}$

Q.57. If x is an integer satisfying $x^2 - 6x + 5 \leq 0$ and $x^2 - 2x \geq 0$ then the number of possible values of x is:-

- (A) 3
- (B) 4

- (C) 2
 (D) Infinite

Q.58. The product of n positive numbers is 1. Their sum is:-

- (A) A positive integer
 (B) Divisible by n
 (C) Equal to $n + (1/n)$
 (D) Greater than or equal to n

Q.59. The minimum value of $4^x + 4^{1-x}$, $x \in \mathbb{R}$ is:-

- (A) 1
 (B) 2
 (C) 4
 (D) None of the above

Q.60. If the lines joining the origin to the points of intersection of $y = mx + 1$ with $x^2 + y^2 = 1$ are perpendicular then $m =$

- (A) 2
 (B) ± 1
 (C) $\frac{1}{2}$
 (D) None of the above

Q.61. Let the vertices of a triangle be $(0, 0)$, $(0, 2)$ and $(2, 0)$. The distance between its orthocentre and circum centre is:-

- (A) $1/\sqrt{2}$
 (B) $\sqrt{2}$
 (C) 0
 (D) None of the above

Q.62. Which of the following is the equation of a plane?

- (A) $z = 0$
 (B) $lx + my = n$
 (C) $2x + 3y = 0$
 (D) $y = x$

Q.63. The straight roads intersect at an angle of 60° . A bus on one road is 2 km away from the intersection and a car on the other road is 3 km away from the intersection. Then the direct distance between the two vehicles is:-

- (A) $\sqrt{2}$ km
 (B) 1 km

- (C) $\sqrt{7}$ km
 (D) 4 km

Q.64. The perimeter of a ΔABC is 6 times the arithmetic mean of the sines of its angles. If the side a is 1 then the angle A is:-

- (A) $\pi/3$
 (B) $\pi/6$
 (C) π
 (D) $\pi/2$

Q.65. In a triangle ABC , $\tan 3A - \tan 2A - \tan A$ is equal to:-

- (A) $-\tan 3A \tan 2A \tan A$
 (B) $\tan A \tan 2A - \tan 2A \tan 3A - \tan 3A \tan A$
 (C) $\tan A \tan 2A \tan 3A$
 (D) None of the above

Q.66. If the angle A of a triangle ABC is given by the equation $5 \cos A + 3 = 0$ then $\sin A$ and $\tan A$ are the roots of the equation:-

- (A) $15x^2 - 8\sqrt{2}x + 16 = 0$
 (B) $15x^2 - 8x - 16 = 0$
 (C) $15x^2 + 8x + 16 = 0$
 (D) $15x^2 + 8x - 16 = 0$

Q.67. A coin is tossed repeatedly. A and B call alternately for winning a prize of Rs.30/-. One who calls correctly first wins the prize. A starts the call. Then expectation of:-

- (A) A is Rs.10/-
 (B) B is Rs.10/-
 (C) B is Rs.20/-
 (D) A is Rs.30/-

Q.68. A card is drawn from a pack. The card is replaced and the pack is reshuffled. If this is done 6 times, the probability that 2 hearts, 2 diamonds and 2 black cards are drawn is:-

- (A) $90/2^{10}$
 (B) $90 (1/4)^6$
 (C) $(45/2) (3/4)^4$
 (D) None of the above

Q.69. A fair coin is tossed repeatedly. The probability of getting a result in the fifth toss different from those obtained in the first four tosses is:-

- (A) $1/16$
- (B) $1/2$
- (C) $31/32$
- (D) $1/32$

Q.70. A fair coin is tossed repeatedly. The probability of getting a result in the fifth toss different from those obtained in the first four tosses is:-

- (A) $1/16$
- (B) $1/2$
- (C) $31/32$
- (D) $1/32$

Q.71. The total number of seven-digit numbers, sum of whose digits is even, is:-

- (A) 9×10^6
- (B) 81×10^5
- (C) 45×10^5
- (D) 9×10^5

Q.72. If C is the middle point of AB and P is any point outside AB then:-

- (A) $PA + PB + 2PC = 0$
- (B) $PA + PB = 2PC$
- (C) $PA + PB = PC$
- (D) $PA + PB + PC = 0$

Q.73. The system of equations $ax + 4y + z = 0$, $bx + 3y + z = 0$, $cx + 2y + z = 0$ has non trivial solutions if a, b, c is in:-

- (A) G.P.
- (B) A.P.
- (C) H.P.
- (D) None of the above

Q.74. Forces 7, 5 and 3 acting on a particle are in equilibrium. The angle between the last pair of forces is:-

- (A) 120
- (B) 30
- (C) 60
- (D) 90

Q.75. Which of the following differential equations has the same order & degree?

- (A) $(d^4y / dx^4) + 8 (dy / dx)^6 + 5y = e^x$
- (B) $5(d^3y/dx^3) + 8[1+(dy/dx)]^2 + 5y = e^{8x}$
- (C) $y = x^2 (dy / dx) + [1 + (dy / dx)^2]^{1/2}$
- (D) $[1 + (dy / dx)^{3/2}] = 4(d^3y / dx^3)$

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